

**I CLAIM:**

1           1.     An exhaust extracting device comprising:  
2                 an outer tube having an inlet, an inlet adapter portion, an increased  
3                 diameter center portion, an outlet adapter portion, an outlet, and a central axis;  
4                 an inner tube substantially co-axial with said outer tube, the inner tube  
5                 having an outer surface;  
6                 helically oriented vanes extending outward from the outer surface of the  
7                 inner tube;  
8                 at least two supports extending between the inner tube and the outer  
9                 tube, wherein the supports are substantially orthogonal to the outer surface of  
10                the inner tube, and have a fanblade like orientation, wherein the vanes and  
11                supports cooperate to cause an outer air flow between the inner tube and the  
12                outer tube to rotate.

1           2.     The device of Claim 1, wherein:  
2                 the inlet adapter portion is between approximately four inches long and  
3                 approximately six inches long;  
4                 the outlet adapter portion is between approximately four inches long and  
5                 approximately six inches long;  
6                 the inner tube has an inner tube entrance and an inner tube exit;

7           the inlet adapter portion of the outer tube has an inlet adapter entrance  
8           and an inlet adapter exit;

9           the outlet adapter portion of the outer tube has an outlet adapter entrance  
10          and an outlet adapter exit;

11          the inner tube entrance resides outwardly with respect to the inlet adapter  
12          exit toward the inlet adapter entrance between zero and seventy five percent of  
13          the distance between the inlet adapter exit and the inlet adapter entrance; and

14          the inner tube exit resides outwardly with respect to the outlet adapter  
15          entrance toward the outlet adapter exit between zero and seventy five percent of  
16          the distance between the outlet adapter entrance and the outlet adapter exit.

3.       The device of Claim 2, wherein the inner tube entrance resides at  
approximately thirty three percent of the distance between the inlet adapter exit  
and the inlet adapter entrance.

4.       The device of Claim 2, wherein the inner tube exit resides at  
approximately thirty three percent of the distance between the outlet adapter  
entrance and the outlet adapter exit.

5. The device of Claim 1, wherein the center portion of the outer tube is between approximately 2.5 inches in diameter to approximately five inches in diameter.
6. The device of Claim 1, wherein the center portion of the outer tube is between approximately fourteen inches long and approximately twenty inches long.
7. The device of Claim 1, wherein the inner tube has an inner tube entrance and an inner tube exit; and wherein the at least two supports comprise between three and ten inlet supports proximal to the inner tube entrance and between three and ten outlet supports proximal to the inner tube exit.
8. The device of Claim 7, wherein the inlet supports comprise between eight and ten inlet supports proximal to the inner tube entrance.
9. The device of Claim 7, wherein the inlet supports are turned at between approximately thirty five degrees and approximately fifty five degrees from the central axis.

10. The device of Claim 7, wherein the outlet supports comprise four outlet supports proximal to the inner tube exit.
11. The device of Claim 7, wherein the outlet supports are turned at approximately sixty degrees from the central axis.
12. The device of Claim 1, wherein the at least two supports are between approximately one half inches long and approximately five eighths inches long.
13. The device of Claim 10, wherein the at least two supports are turned at approximately forty five degrees from the central axis.
14. The device of Claim 1, wherein the vanes extend between approximately three sixteenths and approximately one fourth inches outwardly from the outside surface of the inner tube.
15. The device of Claim 14, wherein the inner tube has an inside surface, and wherein the vanes further extend between approximately three sixteenths and approximately one fourth inches inwardly from the inside surface of the inner tube.

1        16.    The device of Claim 14, wherein the vanes comprise pairs of vanes on  
2        opposite sides of the inner tube, and wherein the vanes are between  
3        approximately two inch and approximately three inch segments, which segments  
4        are spaced between approximately one half inches and approximately one inch  
5        apart.

17.    The device of Claim 14, wherein the inner tube further includes reliefs,  
wherein the reliefs are substantially parallel to the vanes.

18.    The device of Claim 14, wherein the reliefs are between approximately  
one eighth inches and approximately three sixteenths inches wide.

1        19.    An exhaust extracting device comprising:  
2            an outer tube having:  
3                an inlet;  
4                an inlet adapter portion between approximately four inches long  
5        and approximately six inches long and having an inlet adapter entrance and an  
6        inlet adapter exit;  
7                an increased diameter center portion;

8                   an outlet adapter portion between approximately four inches long  
9                   and approximately six inches long and having an outlet adapter entrance and an  
10                  outlet adapter exit; and

11                  an outlet, and a central axis;

12                  an inner tube substantially co-axial with said outer tube, the inner tube  
13                  having an outer surface, an inner tube entrance and an inner tube exit;

14                  helically oriented vanes extending outward from the outer surface of the  
15                  inner tube between approximately three sixteenths and approximately one fourth  
16                  inches inwardly from the inside surface of the inner tube;

17                  between three and ten inlet supports proximal to the inner tube entrance  
18                  and between three and ten outlet supports proximal to the inner tube exit, said  
19                  supports extending between the inner tube and the outer tube, wherein the  
20                  supports are substantially orthogonal to the outer surface of the inner tube, and  
21                  have a fanblade like orientation, wherein the vanes and supports cooperate to  
22                  cause an outer air flow between the inner tube and the outer tube to rotate,  
23                  wherein:

24                  the inner tube entrance resides outwardly with respect to the inlet adapter  
25                  exit toward the inlet adapter entrance between zero and seventy five percent of  
26                  the distance between the inlet adapter exit and the inlet adapter entrance; and

the inner tube exit resides outwardly with respect to the outlet adapter entrance toward the outlet adapter exit between zero and seventy five percent of the distance between the outlet adapter entrance and the outlet adapter exit.

20. An exhaust extracting device comprising:

an outer tube having:

an inlet;

an inlet adapter portion between approximately four inches long and approximately six inches long and having an inlet adapter entrance and an inlet adapter exit;

an increased diameter center portion;

an outlet adapter portion between approximately four inches long and approximately six inches long and having an outlet adapter entrance and an outlet adapter exit; and

an outlet, and a central axis;

an inner tube substantially co-axial with said outer tube, the inner tube having an outer surface and an inner surface, an inner tube entrance and an inner tube exit;

helically oriented vanes extending outward from the outer surface of the inner tube between approximately three sixteenths and approximately one fourth inches inwardly from the inside surface of the inner tube, and wherein the vanes

also extend between approximately three sixteenths and approximately one fourth inches inwardly from the inside surface of the inner tube;

between three and ten inlet supports proximal to the inner tube entrance and between three and ten outlet supports proximal to the inner tube exit, said supports extending between the inner tube and the outer tube, wherein the supports are substantially orthogonal to the outer surface of the inner tube, and have a fanblade like orientation, wherein the vanes and supports cooperate to cause an outer air flow between the inner tube and the outer tube to rotate, wherein:

the inner tube entrance resides outwardly with respect to the inlet adapter exit toward the inlet adapter entrance between zero and seventy five percent of the distance between the inlet adapter exit and the inlet adapter entrance; and

the inner tube exit resides outwardly with respect to the outlet adapter entrance toward the outlet adapter exit between zero and seventy five percent of the distance between the outlet adapter entrance and the outlet adapter exit.